hybrids among the species of the genus. From this statement it is evident that normal fertilization in certain species of *Taraxacum* might be expected.

IKENO[16] has been investigating this situation, and has published recently some of his results. Two species of *Taraxacum* grow in Tokyo, *T. platycarpum* Dahlst. and *T. albidum* Dahlst. During 1908 and 1909, TANAKA, after RAUNKIÄR'S method, made castration experiments with the two species and found that *T. albidum* only formed seeds parthenogenetically. In the spring of 1910, IKENO found growing in a field three different varieties of *T. platycarpum* which might perhaps be elementary species in the DEVRIES' sense. With these forms, he performed the following experiments. When the heads were enveloped with sacs, no seeds were matured; which means that in this case there occurred neither self-fertilization, parthenogenesis, nor effective pollination among the flowers in the same head. A similar experiment was tried with *T. albidum*, and the heads with and without sacs produced seeds. Then he took another variety of *Taraxacum* and put sacs around the heads, which later withered entirely. Then he brushed the surface of the heads of the variety before applying sacs, in order to carry the pollen of one flower to another of the same head, and only 5 out of 80 flowers in a head matured perfect seeds; but when the pollen of another head was applied, the majority of the flowers matured seeds. From these experiments he concludes that in *T. platycarpum* there occur no cases of parthenogenesis, while in the other forms of *Taraxacum* cases of parthenogenesis and normal fertilization both occur.—S. YAMANOUCHI.

Inflorescence and ovules of Gnetum.—Mrs. THODAY (SYKES)[17] has investigated the ovulate strobilus and ovules of *Gnetum africanum*, from material obtained by PEARSON during the Percy Sladen Memorial Expedition in southwest Africa. The vascular situation presents some facts of unusual interest. In the nodes of the ovulate strobilus three concentric rings of bundles occur, the middle one being oriented inversely in relation to the other two, and concentric bundles occurring frequently in the two outer rings. The vascular connections of a single ovulate "flower" in *G. africanum* are said to bear "a remarkably close resemblance to the method of supply to the axillary inflorescence in *Bennettites*." A ring of bundles enters the base of the ovule, and finally breaks into three sets, which traverse the three "coverings" of the ovule, the innermost set traversing the inner integument to and sometimes beyond its separation from the nucellus. A well developed pollen chamber is present in the young ovule, and later the apex of the nucellus hardens and forms a pointed cap.

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[16] IKENO, S., Sind alle Arten der Gattung *Taraxacum* parthenogenetisch? Ber. Deutsch. Bot. Gesells. **28**:394–397. 1911.

[17] THODAY (SYKES), MARY G., The female inflorescence and ovules of *Gnetum africanum*, with notes on *Gnetum scandens*. Ann. Botany **25**:1101–1135. *pls. 86, 87. figs. 16.* 1911.

The conclusions are that "the radial structure of the seed, the short free apical portion of the nucellus, the presence of a pollen chamber, the extension of the bundle system into the free portion of the inner integument, the complex structure of the outer integument, are all points of contrast with *Welwitschia*, and probably indicate the more primitive nature of the *Gnetum* ovule." Resemblances to *Bennettites* are also pointed out, and the general impression is left that *Gnetum*, *Welwitschia*, *Bennettites*, and *Lagenostoma*, on the basis of ovule structure, are all from some common ancestral stock.—J. M. C.

Annual ring and medullary rays of Quercus.—GROOM[18] has investigated the evolution of the annual ring and medullary rays of the oak, using numerous and widely distributed species, and has reached the following conclusions. The very distinct annual rings of the deciduous species become less marked in evergreen species, but may be recognized by certain structural features that are enumerated, any one or more of which may be lacking. There is an interesting correspondence between the habit and the arrangement of the large vessels in the annual ring. "Species showing the most striking pore-zone are deciduous; those showing it regularly and distinctly, but not having so marked a disproportion in size between the innermost and outermost vessels, are subevergreen; whilst those species with no trace of a pore-zone are truly evergreen." In addition to these categories, there are transitional forms with corresponding transitions in the pore-zone display.

All species were found to possess uniseriate shallow medullary rays, and some possess also broad, high multiseriate rays; and there are numerous transitional stages between these two kinds of rays. The author was not able to decide which type was primitive, the evidence being contradictory as yet. There are cases, as in seedlings of *Quercus* and *Alnus* (BAILEY and EAMES), in which narrow rays form broad ones; other cases, as in *Fagus* (JOST), in which broad rays divide into smaller ones; and still other cases, as in seedlings of *Fagus* (TABOR), in which both kinds of changes go on simultaneously in the rays of the same annual ring.—J. M. C.

Animal parasites of Nepenthes.—An interesting case of symbiosis, somewhat analogous to the presence of intestinal parasites in animals, has been reported by JENSEN.[19] The pitchers of *Nepenthes* have long been known to be partially filled with a fluid containing enzymes in which dead insects seem to be digested, but only with the observations of the present author has attention been directed to the fact that several species of dipterous larvae appear to develop normally in this fluid. So abundant are they that JENSEN declares that of the hundreds of pitchers he has examined from year to year at Tjibodas,

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[18] GROOM, PERCY, The evolution of the annual ring and medullary rays of *Quercus*. Ann. Botany **25**:983–1003. *pls. 74–76*. 1911.

[19] JENSEN, HJALMAR, *Nepenthes*-Tiere. II. Biologische Notizen. Ann. Jard. Bot. Buitenzorg Suppl. 3. pt. 2. 941–946. 1910.